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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/803,615

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Hibiki Itoh

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EXAMINER

LEE, CYNTHIA K

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

12/10/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/803,615	<b>Applicant(s)</b> ITOH, HIBIKI	
	<b>Examiner</b> CYNTHIA LEE	<b>Art Unit</b> 1795	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 September 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12 and 15-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 and 15-19 is/are rejected.
- 7) ☒ Claim(s) 10 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)         | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9/23/2009 has been entered.

***Response to Amendment***

This Office Action is responsive to the amendment filed on 9/23/2009. Claims 1-12 and 15-19 are pending.

Applicant's prior art arguments have been considered. Claims 1-12 and 15-19 are non-finally rejected for reasons stated herein below.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 10 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The limitation "free-cutting" is unclear or how "free-cutting glass ceramics" is different from just "glass ceramics".

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-6, 8, 12, 15, 16, 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Gordon (US 5069987).

Gordon discloses a single cell of a flat plate type solid oxide fuel cell, comprising:

a first electrode member 38 consisting of a first porous substrate (8:46) having only a plurality of minute holes arranged randomly therein through which all of a fuel gas or air can pass directly to the first electrode member and wherein the porous substrate is the only gas flow path in the first electrode member, said porous substrate having a sufficient gas flow property. Gordon's first electrode has sufficient gas flow property because the gas flows through the porous substrate. Further, the pores of the porous electrode are interpreted as minute.

a solid electrolyte film 31 formed on either a front surface or a back surface of said first electrode member;

a second electrode layer 37 formed on said solid electrolyte film;

a separator film 39 formed on the other surface of said first electrode member;  
said first electrode member being one of a fuel electrode and an air electrode and said second electrode layer being the other one of said fuel electrode and said air electrode;  
and

a seal portion (Gordon's side portion of chamber wall 39) for covering all side surfaces of said first electrode member, said seal portion being scraped off from two opposing areas of two of said side surfaces to define an inlet and an outlet opening for one of a fuel gas and air supplied to the cell, said plurality of minute holes arranging for a flow of said fuel gas or air toward said outlet opening from said inlet, and for a flow of said fuel gas or air in a vertical direction and in a horizontal direction locally,

wherein the entire first electrode member forms one of a fuel flow path and an air flow path through the cell with no through-passages.

Regarding the limitation "scrapped off", it is noted that the electrolyte (applicant's seal portion) of Gordon does not exist on the side surfaces of the cathode 38, and thus meets the limitation "scrapped off."

It is noted that an entire cross section of the electrodes form a gas flow path because the electrode materials are porous (8:48-50)

Regarding claim 2, at least one of a part of said solid electrolyte film 31 and a part of said separator film 39 comprises said seal portion and forms a gas seal film.

Regarding claim 3, said seal portion (side wall of chamber wall 39) includes a side film portion which covers each entire area of side surfaces of one of two pairs of opposed side surfaces of said first electrode member 38 and seals said covered side surfaces to prevent said fuel gas or air from escaping.

Regarding claim 5, the fuel cell stack is arranged in series in a lamination direction to form a laminated body; and a conductive spacer 33 provided between adjacent cells.

Regarding claim 6, the spacer 33 is a porous substrate (6:66).

Regarding claim 8, a conductive jointing material 39 is provided between said spacer and said separator film opposed to each other in said single cells which are adjacent to each other. It is noted that when the individual cell are stacked as shown in fig. 5, the chamber wall 39 is provided between the current pickup 33 and the chamber wall 39 of the other electrode.

Regarding claim 12, Gordon discloses a single cell of a flat plate type solid oxide fuel cell comprising:

- a first electrode member 38 consisting of a porous substrate 38 having only a plurality of minute holes arranged randomly therein through which all of a fuel gas or air passes, and having two pairs of opposite side surfaces and wherein all of the fuel gas or air can pass directly to the first electrode member and wherein the porous substance is the only gas flow path in the first electrode member, said porous substrate having a sufficient gas flow property;

- a solid electrolyte film 31 formed on either a front surface or a back surface of said first electrode member;

- a second electrode layer 37 formed on said solid electrolyte film 31;
- and a separator film 39 formed on the other surface of said first electrode member, wherein said first electrode member is one of a fuel electrode and an air electrode, and said second electrode layer is the other one of said fuel electrode and said air electrode, and an entire cross section of one pair of said opposite side surfaces of said first electrode member being a gas flow opening and path, with no through-passages,

wherein both front and back surfaces of said first electrode member being covered with said solid electrolyte film 31 and said separator film 39 respectively,

wherein at least one of a part of said solid electrolyte film 31 and a part of and said separator film 39 being a seal portion which covers a part of side surfaces between said solid electrolyte film and said separator film of said first electrode member 38 and forms a gas seal film, and wherein said seal portion including a side film portion which covers each entire area of the other pair of said side surfaces of said first electrode member and seals said covered side surfaces to prevent said fuel gas or air from escaping, the plurality of minute holes arranging for a flow of said fuel gas or air between the one pair of said opposite side surface of said first electrode member, and for a flow of said fuel gas or air in a vertical direction and in a horizontal direction locally.

It is interpreted that since the gas is not guided by particular channels, the gas naturally flows in a vertical and a horizontal direction. Further, the pores of the porous electrode are interpreted as minute.

Regarding claim 15, said air flow path and said fuel flow path are parallel with respect to one another. Fig. 1.

Regarding claim 16, said air and fuel flow paths are arranged in a counter-current flow relationship. Fig. 1.

Regarding claim 19, an entire cross section of the cell extending between the inlet and the outlet forms one of the fuel flow path and the air flow path. See fig. 5.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 4 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Gordon (US 5069987) as applied to claim 1.

Gordon discloses all the limitations of claim 1 and are incorporated herein.

Claim 4 is a product-by-process claim. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior art product was made by a different process. In re Thorpe, 777 F. 2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:



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A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 9 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gordon (US 5069987) as applied to claim 5, in view of Barnett (US 5770327).

Gordon discloses all the elements of claim 5 and are incorporated herein.

Regarding claims 9 and 18, Gordon does not disclose wherein manifold plates formed of ceramics are attached on side surfaces of said laminated body. Barnett teaches manifold plates 33 formed of ceramics are attached on side surfaces of said laminated body. Regarding claim 18, the manifold plates comprising first openings corresponding to one of said air flow path and said fuel flow path and second openings corresponding to the other one of said air flow path and said fuel flow path. See fig. 3 and 2:48-65. It would have been obvious to one of ordinary skill in the art at the time the invention was made to dispose the fuel cell stack of Gordon in the ceramic manifolds of Barnett for the benefit of distributing gases and withstanding the high operating temperature of solid oxide fuel cell stack.

Claims 11 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gordon (US 5069987) as applied to claim 5, in view of Poeppel (US 4476196).

Gordon discloses all the elements of claim 5 and are incorporated herein.

Gordon does not disclose reactant paths being orthogonal to each other.

Poeppel teaches orthogonal gas flow paths. See. Fig. 1. It would have been obvious to

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one of ordinary skill in the art at the time the invention was made to orient the reactant flow paths orthogonally since either counter current of Gordon, or orthogonal flow path of Barnett would deliver reactant gas to the fuel cell electrodes.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gordon (US 5069987) as applied to claim 5, in view of Barnett (US 5770327) as applied to claim 9, further in view of Ketcham (US 6045935)

Gordon modified by Barnett teaches all the elements of claim 9 and are incorporated herein.

Gordon modified by Barnett teaches that the manifold is made of ceramics, but does not teach a free-cutting glass-ceramic. Ketcham teaches a manifold made of glass-ceramic (4:7). It would have been obvious to one of ordinary skill in the art at the time the invention was made to made the manifold of Gordon modified by Barnett of glass-ceramic since it has been held by the court that the selection of a known material based on its suitability for its intended use is *prima facie* obvious. Sinclair & Carroll Co. v. Interchemical Corp., 325 U.S. 327, 65 USPQ 297 (1945). See MPEP 2144.07.

Absent specific degree of “free-cutting”, it is noted that the glass-ceramic of Ketcham is free-cutting glass ceramic because it has the ability to be processed.

### ***Response to Arguments***

Applicant's arguments filed 9/23/2009 have been considered but are moot in view of the new ground(s) of rejection.

### ***Allowable Subject Matter***

The following is a statement of reasons for the indication of allowable subject matter:

Claim 7 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Prior art does not disclose nor suggest "wherein said porous substrate consists of a material which is the same as that of said second electrode layer" of claim 7.

The closest prior art is Gordon (US 5069987). Gordon discloses a current pickup 33 that is porous. It is made of silver/palladium coating on a woven Inconel 600 (6:66-67). The fuel cell is a solid oxide fuel cell, in which the electrode 37 would be made of ceramic. There would not be motivation to form the porous current pickup with a ceramic material because a metal is more electrically conductive than a ceramic.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cynthia Lee whose telephone number is 571-272-8699. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Cynthia Lee/  
Examiner, Art Unit 1795